REMARKS

Claims 15, 18, and 20 stand rejected under 35 U.S.C. § 112, second paragraph. More specifically, the limitation of "a holder made of a soft material" has been rejected. This limitation is not included in claim 15 of the present application. Further, there are no claims 18 and 20 in the present application. Therefore, Applicants believe that the rejection of claims 15, 18, and 20 under 35 U.S.C. § 112, second paragraph is a mistake.

Claims 9 and 13 have been rejected under 35 U.S.C. § 112, second paragraph. More specifically, the limitation of "a mechanism for powering said motor" has been rejected. This limitation has been deleted from claims 9 and 13.

Claims 1-4 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Ibata et al. (JP 10-217272) in view of Koyama (JP 08-067449) and Obara (U.S. Patent No. 6,420,809). Claims 5-8 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Koyama in view of Obara. Claims 9-12 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Ibata in view of Koyama, Obara and Okuyama et al. (U.S. Patent No. 5,798,588). Claims 13-16 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Koyama in view of Obara and Okuyama.

It is respectfully submitted, however, that the claims, as amended, are patentable over the art of record for the reasons set forth below.

Ibata discloses a slender cylindrical coreless motor including a pipe 2 with one end fixed to frame 1 (see Abstract). Koyama discloses a motor having a coreless rotor 2 which includes a cylindrical housing 11, where a bearing housing 12 is attached at the inside of cylindrical housing 11 (see Abstract). Koyama also discloses a magnet 17 attached to the outer circumference of bearing housing 12 (see Abstract). Obara discloses a bearing structure for a flat motor wherein the outer race or inner race of the bearing structure includes a single row ball bearing and a cylindrical bearing (see Abstract). Okuyama discloses a vibrating motor including an eccentric weight attached to an end of a shaft projecting from the motor housing (see Abstract).

Applicants' invention, as recited by claim 1, includes a feature which is neither disclosed nor suggested by the art of record, namely:

> ...the difference between an inner diameter of the frame and an outer diameter of the pipe is between 0 μm and 20 μm...

This means that the motor recited in claim 1 includes a cylindrical frame and a pipe fitted in and disposed within the cylindrical frame. The frame has an inner diameter and the pipe has an outer diameter. The difference between the inner diameter of the frame and the outer diameter of the pipe is between 0 μm and 20 μm. This difference is known as a "fit-in margin" throughout the originally filed application. This feature is disclosed in the originally filed application at page 5, lines 19-22. No new matter has been added.

None of the references cited (Ibata, Koyama, Obara and Okuyama) disclose or suggest the fit-in margin recited in claim 1.

In regard to the fit-in margin, the Office Action indicates that (1) "where the range of article sizes disclosed in the prior art envelopes the recited range" and (2) "there is no showing of criticality of the recited range," then the recited range would have been obvious to one of ordinary skill in the art. The prior art of record discloses a fit-in margin ranging from 20 μm to 30 μm (see originally filed application at page 2, line 7), and as such, the fit-in margin range recited in claim 1 is not enveloped by the fit-in margin range disclosed by the prior art. Additionally, the fit-in margin recited in claim 1 is critical. For example, a fit-in margin within the range of 20 μm to 30 μm results in the inner diameter of bearing 357 being contracted, thereby resulting in an unstable RPM of the motor (see original filed application at page 2, lines 7-13). By including the limitation of a fit-in margin of between 0 μm to 20 μm in claim 1 of the present invention, the motor is able to withstand significant shock, and there is reduced variation in the inner diameter of bearing 7, such that the RPM of the motor is more stable (see originally filed application at page 5, lines 24-26).

Accordingly, claim 1 is patentable over the art of record for the reasons set forth above. Claims 5, 9, and 13, include features similar to those recited above with respect to claim 1. Accordingly, claims 5, 9, and 13 are also patentable over the art of record for the reasons set forth above. Claims 2-4, 6-8, 10-12, and 14-16 include all of the features of the independent claims from which they depend, either directly or indirectly. Thus, claims 2-4, 6-8, 10-12, and 14-16 are also patentable over the art of record for the reasons set forth above.

In view of the amendments and arguments set forth above, the above-identified application is in condition for allowance which action is respectfully requested.

Respectfully Submitted,

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Enclosure: Version with markings to show changes made

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE CLAIMS:

1. (Amended) A motor comprising:

(a) a cylindrical frame made of ferromagnetic material;

(b) a pipe fitted in and disposed within said frame concentrically, the difference between an inner diameter of the frame and an outer diameter of the pipe is between 0 μm and 20 μm;

(c) a sintered bearing press-fitted into said pipe;

(d) a cylindrical magnet fixed on an outer wall of said pipe at an inner wall of said magnet; and

(e) a cylindrical coil facing said magnet via an annular space,

wherein said frame and said pipe are welded at a fitted section therebetween.

5. (Amended) A motor comprising:

(a) a cylindrical frame made of ferromagnetic material;

(b) a pipe fitted in and disposed within said frame concentrically, the difference between an inner diameter of the frame and an outer diameter of the pipe is between 0 μm and 20 μm;

(~~b~~c) a sintered bearing fitted in and disposed within said frame concentrically;

(~~c~~d) a cylindrical magnet fixed on an outer wall of said sintered bearing at an inner wall of said magnet; and

(~~d~~e) cylindrical coil facing said magnet via an annular space,

wherein said frame and said sintered bearing are welded at a fitted section therebetween.

9. (Amended) An apparatus comprising:

(a) a housing; and

(b) a motor disposed in said housing, said motor including:

(b-1) a cylindrical frame made of ferromagnetic material;

(b-2) a pipe fitted in and disposed within said frame concentrically, the difference between an inner diameter of the frame and an outer diameter of the pipe is between 0 μm and 20 μm;

(b-3) a sintered bearing press-fitted into said pipe;

(b-4) a cylindrical magnet fixed on an outer wall of said pipe at an inner wall of said magnet; and

(b-5) a cylindrical coil facing said magnet via an annular space,

wherein said frame and said pipe are welded at a fitted section therebetween~~, and~~

~~(c) a mechanism for powering said motor~~.

13. (Amended) An apparatus comprising:

(a) a housing;

(b) a motor disposed in said housing, said motor including:

(b-1) a cylindrical frame made of ferromagnetic material;

(b-2) a sintered bearing fitted in and disposed within said frame concentrically;

(b-3) a cylindrical magnet fixed on an outer wall of said sintered bearing at an inner wall of said magnet; and

(b-4) a cylindrical coil facing said magnet via an annular space, and

(c) a pipe fitted in and disposed within said frame concentrically, the difference between an inner diameter of the frame and an outer diameter of the pipe is between 0 μm and 20 μm,

wherein said frame and said sintered bearing are welded at a fitted section therebetween~~, and~~

(c) ~~a mechanism for powering said motor~~.